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# McGraw-Hill DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS

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## Fourth Edition

**Sybil P. Parker**

EDITOR IN CHIEF

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On the cover: Pattern produced from white light by a computer-generated diffractive plate containing 529 square apertures arranged in a 23 x 23 array.  
(R. B. Hovr, Marshall Space Flight Center)

On the title pages: Aerial photograph of the Sinai Peninsula made by Gemini spacecraft. (NASA)

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**McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS,  
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expands, utilized in riveters, diggers, pile ventilating systems.

of a substance capable of pressure; quantum. {kəm'pres-ə'bil}

region of disturbed wave. {kəm'pres}

The correction of the compressibility error.

error in the readings of indicator due to part of the pitot tube. {kəm'pres-ə'bil-əd}

product of the pressure by the product of the unit; this factor may be account the departure so known as deviation compressibility factor.

in which the fluid den-

The principle that by to consider that the e that it has a constant.

Gas flow when the ough a system is large e, to cause a 10% or res-ə'bəl 'flū-əd flō) data compression. ain of a device at one lower level of signal, be lost in background the system. 2. See ng. [GEOL] A sys-ic volume or shorten e of a substance due e type of stress which en member. [MECH esh-ən] bance traveling in an es in volume and by 1 of wave movement. ional wave; pressure {kəm'presh-ən, kə-

1. A means of con- hich a slotted tapered vo flanges are drawn center the shafts and nsmit medium loads. -ən, kəp'liŋ}

n which lubricant is əm'presh-ən, kəp} or collapse caused by mn or of wood fibers.

ment that measures re. {kəm'presh-ən}

gnition produced by i internal combustion resh-ən ig'nish-ən} diesel engine.

or. {kəm'presh-ən}

n or other structural stress. {kəm'presh-ən}

**compression modulus** See bulk modulus of elasticity.

**compression mold** [ENG] A mold for plastics which is open when the material is introduced and which shapes the material by heat and by the pressure of closing. {kəm'presh-ən, mōld}

**compression plant** [PETRO ENG] Gas-compression facility used to produce a high-pressure gas stream for injection into reservoir formations to increase oil yield; when the injected gas is that recovered from the well during oil production, the facility is called a gas-cycling plant. {kəm'presh-ən, plant}

**compression pressure** [MECH ENG] That pressure developed in a reciprocating piston engine at the end of the compression stroke without combustion of fuel. {kəm'presh-ən, presh-ər}

**compression process** [CHEM ENG] The recovery of natural gasoline from gas containing a high proportion of hydrocarbons. {kəm'presh-ən, prə'sas}

**compression ratio** [ELECTR] The ratio of the gain of a device at a low power level to the gain at some higher level, usually expressed in decibels. Also known as compression. [MECH ENG] The ratio in internal combustion engines between the volume displaced by the piston plus the clearance space, to the volume of the clearance space. Also known as compression. [MET] Ratio of the volume of loose metal powder to the volume of the compact made from it. {kəm'presh-ən, rā-shō}

**compression refrigeration** [MECH ENG] The cooling of a gaseous refrigerant by first compressing it to liquid form (with resultant heat buildup), cooling the liquid by heat exchange, then releasing pressure to allow the liquid to vaporize (with resultant absorption of latent heat of vaporization and a refrigerative effect). {kəm'presh-ən ri'frij-ə'rā-shən}

**compression release** [MECH ENG] Release of compressed gas resulting from incomplete closure of intake or exhaust valves. {kəm'presh-ən ri'lēs}

**compression spring** [ENG] A spring, usually a coil spring, which resists a force tending to compress it. {kəm'presh-ən, sprɪŋ}

**compression strength** [MECH] Property of a material to resist rupture under compression. {kəm'presh-ən, streŋkθ}

**compression stroke** [MECH ENG] The phase of a positive displacement engine or compressor in which the motion of the piston compresses the fluid trapped in the cylinder. {kəm'presh-ən, strōk}

**compression syndrome** See crush syndrome. {kəm'presh-ən, sɪn'drōm}

**compression test** [ENG] A test to determine compression strength, usually applied to materials of high compression but low tensile strength, in which the specimen is subjected to increasing compressive forces until failure occurs. {kəm'presh-ən, test}

**compression wave** [FL MECH] A wave in a fluid in which a compression is propagated. {kəm'presh-ən, wæv}

**compression wood** [BOT] Dense wood found at the base of some tree trunks and on the undersides of branches. {kəm'presh-ən, wūd}

**compressive intercept receiver** [ELECTR] An electromagnetic surveillance receiver that instantaneously analyzes and sorts all signals within a broad radio-frequency spectrum by using pulse compression techniques which perform a complete analysis up to 10,000 times faster than a superheterodyne receiver or spectrum analyzer. {kəm'pres-iv 'ɪnt-ə,sept ri'se-vər}

**compressive strength** [MECH] The maximum compressive stress a material can withstand without failure. {kəm'pres-iv streŋkθ}

**compressive stress** [MECH] A stress which causes an elastic body to shorten in the direction of the applied force. {kəm'pres-iv 'stres}

**compressor** [ELECTR] The part of a compandor that is used to compress the intensity range of signals at the transmitting or recording end of a circuit. [MECH ENG] A machine used for increasing the pressure of a gas or vapor. Also known as compression machine. {kəm'pres-ər}

**compressor blade** [MECH ENG] The vane components of a centrifugal or axial-flow, air or gas compressor. {kəm'pres-ər, blād}

**compressor station** [MECH ENG] A permanent facility

which increases the pressure on gas to move it in transmission lines or into storage. {kəm'pres-ər, stā'shən}

**compressor valve** [MECH ENG] A valve in a compressor, usually automatic, which operates by pressure difference (less than 5 pounds per square inch or 35 kilopascals) on the two sides of a movable, single-loaded member and which has no mechanical linkage with the moving parts of the compressor mechanism. {kəm'pres-ər, valv}

**compromise joint** [CIV ENG] 1. A joint bar used for joining rails of different height or section. 2. A rail that has different joint drillings from that of the same section. {kəm'prā,miz 'joɪnt}

**compromise network** [ELEC] 1. Network employed in conjunction with a hybrid coil to balance a subscriber's loop; adjusted for an average loop length or an average subscriber's set, or both, to secure compromise (not precision) isolation between the two directional paths of the hybrid. 2. Hybrid balancing network which is designed to balance the average of the impedances that may be connected to the switchboard side of a hybrid arrangement of a repeater. {kəm'prā,miz 'net, wɜrk}

**compromise rail** [CIV ENG] A short rail having different sections at the ends to correspond with the rail ends to be joined, thus providing a transition between rails of different sections. {kəm'prā,miz, rāl}

**compromising emanations** [COMMUN] Unintentional data-related or intelligence-bearing signals which, if intercepted and analyzed by any technique, could disclose the classified information transmitted, received, handled, or otherwise processed by equipments. {kəm'prā,mizɪŋ,em-ə'nā'shənz}

**Compton absorption** [QUANT MECH] The absorption of an x-ray or gamma-ray photon in Compton scattering, accompanied by the emission of another photon of lower energy. {kəm'tən əb'sɔrp-shən}

**Compton cross section** [QUANT MECH] The differential cross section for the elastic scattering of photons by electrons. {kəm'tən 'krɒs, sek-shən}

**Compton-Debye effect** See Compton effect. {kəm'tən 'dɛbə i'fekt}

**Compton effect** [QUANT MECH] The increase in wavelength of electromagnetic radiation in the x-ray and gamma-ray region on being scattered by material objects; the scattering is due to the interaction of the photons with electrons that are effectively free. Also known as Compton-Debye effect. {kəm'tən i'fekt}

**Compton electron** See Compton recoil electron. {kəm'tən i'lek, træn}

**Compton-Getting effect** [ASTROPHYS] The sidereal diurnal variation of the intensity of cosmic rays which would be expected from the rotation of the galaxy if cosmic radiation originated in extragalactic regions and was isotropic in intergalactic space, and if this radiation was unaffected at entry to and passage through the galaxy. {kəm'tən 'ged-ɪŋ i'fekt}

**Compton incoherent scattering** [NUC PHYS] Scattering of gamma rays by individual nucleons in a nucleus or electrons in an atom when the energy of the gamma rays is large enough so that binding effects may be neglected. {kəm'tən in-kō'hɪr-ənt 'skad-ərɪŋ}

**comptonization** [ASTRON] The redistribution in the energies of photons in interstellar space that results from their scattering from electrons. {kəm'tən-ə'zā-shən}

**Compton meter** [NUCLEO] An ionization chamber having a balance chamber with a uranium source that is adjusted until it balances out normal cosmic radiation; variations in cosmic radiation are then shown on an electrometer. {kəm'tən, mēd-ər}

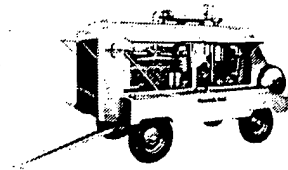
**Compton process** See Compton scattering. {kəm'tən, præs-əs}

**Compton recoil electron** [QUANT MECH] An electron set in motion by its interaction with a photon in Compton scattering. Also known as Compton electron. {kəm'tən ri'kōɪl i'lek, træn}

**Compton recoil particle** [QUANT MECH] Any particle that has acquired its momentum in a scattering process similar to Compton scattering. {kəm'tən ri'kōɪl, pɑrd-əkəl}

**Compton rule** [PHYS CHEM] An empirical law stating that the heat of fusion of an element times its atomic weight divided by its melting point in degrees Kelvin equals approximately 2. {kəm'tən, rül}

## COMPRESSOR



Mobile air compressor unit which is driven by engine in the forward compartment. (Ingersoll-Rand)

efficiency of a countercurrent cool-fluid-warm-fluid heat-exchange system. { 'ten,brū'ka,čhārt }

**tendency** [METEOROL] The local rate of change of a vector or scalar quality with time at a given point in space. { 'ten-dān-sē }

**tendency chart** See change chart. { 'ten-dān-sē,čhārt }

**tendency equation** [METEOROL] An equation for the local change of pressure at any point in the atmosphere, derived by combining the equation of continuity with an integrated form of the hydrostatic equation. { 'ten-dān-sē i,kwā-zhān }

**tendency interval** [METEOROL] The finite increment of time over which a change of the value of a meteorological element is measured in order to estimate its tendency; the most familiar example is the three-hour time interval over which local pressure differences are measured in determining pressure tendency. { 'ten-dān-sē, intārval }

**tender** [NAV ARCH] A naval auxiliary ship that serves as a mobile base for repair and limited resupply of other ships. { 'ten-dər }

**Tendipedidae** [INV ZOO] The midges, a family of orthorhaphous dipteran insects in the series Nematocera whose larvae occupy intertidal wave-swept rocks on the seacoasts. { 'ten-dā'ped-ə,dē }

**tendon** [ANAT] A white, glistening, fibrous cord which joins a muscle to some movable structure such as a bone or cartilage; tendons permit concentration of muscle force into a small area and allow the muscle to act at a distance. [CIV ENG] A steel bar or wire that is tensioned, anchored to formed concrete, and allowed to regain its initial length to induce compressive stress in the concrete before use. { 'ten-dən }

**tendonitis** [MED] Inflammation of a tendon. { 'ten-dā'nīd-əs }

**tendon sheath** [ANAT] The synovial membrane surrounding a tendon. { 'ten-dən,shēth }

**tendrill** [BOT] A stem modification in the form of a slender coiling structure capable of twining about a support to which the plant is then attached. { 'ten-drəl }

**tenebrescence** [PHYS] Darkening and bleaching under suitable irradiation; materials having this property are called scotophors; darkening may be produced by primary x-rays or cathode rays, while bleaching may be produced by heat or by photons of appropriate wavelength. { 'ten-ə'bres-əns }

**Tenebrionidae** [INV ZOO] The darkling beetles, a large cosmopolitan family of coleopteran insects in the superfamily Tenebrionoidea; members are common pests of grains, dried fruits, beans, and other food products. { 'tə,neb-rē'ān-ə,dē }

**Tenebrionoidea** [INV ZOO] A superfamily of the Coleoptera in the suborder Polyphaga. { 'tə,neb-rē'ānōid-ē-ə }

**tenggara** [METEOROL] A strong, dry, hazy, east or southeast wind during the east monsoon in the Spermdunde Archipelago. { 'ten'gārə }

**teniae coli** [HISTOL] The three bands comprising the longitudinal layer of the tunica muscularis of the colon; the tenia libera, tenia mesocolica, and tenia omentalis. { 'tē-nē,ē'kō-lī }

**tennantite** [MINERAL] (Cu,Fe)<sub>12</sub>As<sub>4</sub>S<sub>17</sub>. A lead-gray mineral crystallizing in the isometric system; it is isomorphous with tetrahedrite; an important ore of copper. { 'ten-ən,tīt }

**tenon** [ENG] A tongue-like projection from the end of a framing member which is made to fit into a mortise. { 'ten-ən }

**tenorite** [MINERAL] CuO. A triclinic mineral that occurs in small, shining, steel-gray scales, in black powder, or in black earthy masses; an ore of copper. { 'ten-ə,rīt }

**tenosynovitis** [MED] Inflammation of a tendon and its sheath. { 'ten-ō,sī-nō'vid-əs }

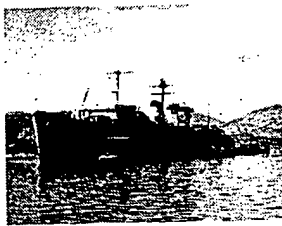
**tenrec** [VERT ZOO] Any of about 30 species of unspecialized, insectivorous mammals which are indigenous to Madagascar and have poor vision and clawed digits. { 'ten,rek }

**Tenrecidae** [VERT ZOO] The tenrecs, a family of insectivores in the group Lipotyphla. { 'ten'res-ə,dē }

**ten's complement** [MATH] In decimal arithmetic, the unique numeral that can be added to a given *N*-digit numeral to form a sum equal to 10<sup>*N*</sup> (that is, a one followed by *N* zeros). { 'tenz'kām-plə-mənt }

**tensile bar** [ENG] A molded, cast, or machined specimen of specified cross-sectional dimensions used to determine the tensile properties of a material by use of a calibrated pull test. Also known as tensile specimen; test specimen. { 'ten-səl,bār }

## TENDER



Polaris submarine tender USS Hunley. (Official U.S. Navy photograph)

## TENDRIL



Portion of a grape plant stem with leaf and tendrill.

## TENEBRIONIDAE



Representative species of family Tenebrionidae. (From T. I. Storer and R. L. Usinger, General Zoology, 3d ed., McGraw-Hill, 1957)

## TENREC



Tenrec, showing characteristic features.

## tensor force

## tensori

**tensile modulus** [MECH] The tangent or secant modulus of elasticity of a material in tension. { 'ten-səl,māj-ə-ləs }

**tensile specimen** See tensile bar. { 'ten-səl,spes-ə-mən }

**tensile strength** [MECH] The maximum stress a material subjected to a stretching load can withstand without tearing. Also known as hot strength. { 'ten-səl,streŋkθ }

**tensile stress** [MECH] Stress developed by a material bearing a tensile load. { 'ten-səl,stes }

**tensile test** [ENG] A test in which a specimen is subjected to increasing longitudinal pulling stress until fracture occurs. { 'ten-səl,tes }

**tensimeter** [ENG] A device for measuring differences in the vapor pressures of two liquids in which the liquids are placed in sealed, evacuated bulbs connected by a differential manometer. { 'ten-sim-əd-ər }

**tensiometer method** [FL MECH] A method of determining the surface tension of a liquid that involves measuring the force necessary to remove a ring of known radius from the liquid surface, usually by means of a torsion balance. { 'ten-she'ām-əd-ər,met'həd }

**tension** [MECH] 1. The condition of a string, wire, or rod that is stretched between two points. 2. The force exerted by the stretched object on a support. { 'ten-shən }

**tension crack** [GEOL] An extension fracture caused by tensile stress. { 'ten-shən,krak }

**tension fault** [GEOL] A fault in which crustal tension is a factor, such as a normal fault. Also known as extensional fault. { 'ten-shən,fəlt }

**tension fracture** [GEOL] A minor rock fracture developed at right angles to the direction of maximum tension. Also known as subsidiary fracture. { 'ten-shən,frak-čhər }

**tension jack** [MIN ENG] A type of jack with a jackscrew for wedging against the mine roof and a ratchet device for applying tension on a chain that is attached to the tail or foot section of a belt conveyor, and used to restore the proper tension to the belt. { 'ten-shən,jak }

**tension joint** [GEOL] A joint that is a tension fracture. { 'ten-shən,jōint }

**tension packer** [PETRO ENG] A device to pressure-seal the annular space between an oil-well casing and tubing, held in place by tension against an upward push; a type of production packer. { 'ten-shən,pak-ər }

**tension pulley** [MECH ENG] A pulley around which an endless rope passes mounted on a trolley or other movable bearing so that the slack of the rope can be readily taken up by the pull of the weights. { 'ten-shən,pul-ē }

**tension-type hanger** [PETRO ENG] A type of tubing hanger for multiple-completion oil wells to allow for the varying lengths of tubing strings. { 'ten-shən,'tīp'hāŋ-ər }

**tension wood** [BOT] In some hardwood trees, wood characterized by the presence of gelatinous fibers and excessive longitudinal shrinkage; causes trees to lean. { 'ten-shən,wūd }

**tensometer** [ENG] A portable machine that is used to measure the tensile strength and other mechanical properties of materials. { 'ten'sām-əd-ər }

**tensor** [MATH] An object relative to a locally euclidean space which possesses a specified system of components for every coordinate system and which changes under a transformation of coordinates. { 'ten-sər }

**tensor analysis** [MATH] The abstract study of mathematical objects having components which express properties similar to those of a geometric tensor; this study is fundamental to Riemannian geometry and the structure of euclidean spaces. Also known as tensor calculus. { 'ten-sər,ə,nal-əs-əs }

**tensor calculus** See tensor analysis. { 'ten-sər,kalkyū-ləs }

**tensor contraction** [MATH] For a tensor having an upper and a lower index, summation over the components in which these indexes have the same value, in order to obtain a new tensor two lower in rank. { 'ten-sər,kən'trak-shən }

**tensor differentiation** [MATH] An operation on a tensor in which a term involving a Christoffel symbol is subtracted from the ordinary derivative, to obtain another tensor of one higher rank. { 'ten-sər,dīf-ə'ren-čē'ā-shən }

**tensor field** [MATH] A tensor or collection of tensors defined in some open subset of a Riemann space. { 'ten-sər,fīld }

**tensor force** [NUC PHYS] A spin-dependent force between nucleons, having the same form as the interaction between magnetic dipoles; it is introduced to account for the observed

values of the moment of tensorial associated undergo a amplex are of a quant tensor mus makes it te tensor pro: tensor who the given performed tensor qua sented by tensor. of a Riem: tentacle processes tions, and many ani Tentacula whose me tentacles. tentaculo of the urn a modifi { 'ten'tak-y tentaculo: a hydrozo: tented arc either a teristics o tented ice ice is pus cavity be tad 'is } tenthero frame (te: can be co tenthmet Tenthred in the sup portant s a,dē } Tenthrec in the su tentillum taining i am } tenting ice unde neath. Tenuipa suborde TEP See tepary t One of tance ir tepee b of soft i tepee s ture co V in cr tepetati tephgri by Naj temper the cha lines a is prop the tephra ra } tephrit chiefly with s Tephri